

Exhibit 10



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Reimbursements #3 (Option 2)

Completed

Due to the interaction with the wallet [yUJw9a2PyogKkH47i4yEGf4WXomSHMiK7Lp29Xs2NgM](#) most users of Mango v3 can not access their funds. This proposal is an alternative to Reimbursements #2 (Option 1), there should be little difference in cost between the two.

In order to reimburse all users that had positive equity, the following procedure was devised:

- The starting point is a solana account snapshot of slot 154856403 (Oct 11, 2022 at 21:20:18 UTC) provided by Triton, which is before the attacker deposited funds into Mango (Oct 11, 2022 at 22:18 UTC) and before MNGO price manipulations began.
- We load this snapshot and compute the USD equity for all mango accounts using the token prices found in the snapshot's mango price cache. An exception is MNGO tokens. It would be unfair to value them at pre-exploit prices, implicitly selling them at the much better price. Thus we use the later reimbursement price instead of the snapshot price for MNGO. This ensures that MNGO holders are paid out token for token.
- Then we apply the deposits and withdraws that happened between the snapshot slot and program halt to the account equity, again at snapshot prices.
- Finally we calculate an appropriate split of assets that fully covers the account equity (using the close prices of 10/17/22 as reported by coingecko) by prioritizing assets that the wallet [9mM6NfXauEFviFY1S1thbo7HXYNiSWSvwZEhguJw26wY](#) has access to. The result of this resembles slippage-free closing of all open margin borrows on every mango account.

The result of that procedure is demonstrated in this [spreadsheet](#) and the code to produce the result is on [github](#).

In order to be able to pay back all equity in various tokens, no new MNGO will be minted from the treasury, but a lot of assets will need to be bought with or sold to USDC (total trade volume around \$33M including \$5M USDT). The total cost of conversion has been estimated by a few trading desks:

Best average premium quoted: 1.1%

Estimated cost of trade: \$360,000

Results

✓ The proposal has passed

Yes Votes

165,155,066

67.4%

No Votes

80,012,160

32.6%

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Discussion (7)

Thoughts?...

Send It

**4DqH8...KyudN** [↗](#)

4 months ago

I think there's ~450\$ missing. Acc value before attack (from UI) = 105663\$. Withdrawn after attack (sum Withdrawal History tab) = 14515\$. Remaining value after withdrawals = $105663 - 14515 = 91148$ \$. MNGO price at the time = 0.039\$ (rounding up in favour of Mango). Account value at the time minus withdrawals and MNGO = 91148\$ - $(250282.6049 \cdot 0.039) = 81386.97$ \$. The sheet says only 80952.10153\$, a difference of = 434.87\$. C88n25xNx8GiEfroaS1ByPHZwWrytsg3mjVYsudKv2xm

**DKSoM...eNTEz** [↗](#)

4 months ago

2HTtu: your account equity was around \$5700 before the exploit which matches the spreadsheet and matches what is visible here at snapshot time (before the incident) in the account value graph: <https://trade.mango.markets/account?pubkey=9m4pE5SBBzyAJ5m68c7nAGUbs144DGDvMnhRRXqJGWMn>

**2HTtu...23WQj** [↗](#)

4 months ago

Just double checked. I am missing not only 36 SOL. I am missing \$1700 USDC on one account and \$257 USDC on second account. And after verifying my deposits the snapshot you are using is at least month old. How many people is missing there deposits? Who and how is going to verify all that.

**2HTtu...23WQj** [↗](#)

4 months ago

I am missing 36 SOL on the spreadsheet on one of my accounts, the second account is OK. That snapshot is at least 2-3 weeks old.

**2Arpi...w5LzF** [↗](#)

4 months ago

i think we should optimize for reduced trading fees

**3ovDa...mVypN** [↗](#)

4 months ago

Agree, the difference in trading costs is \$800K, this is obviously the better option

**HPhxs...8L3e1** [↗](#)

4 months ago

Minimizing trading costs should be the priority. There is no guarantee these quoted spreads remain when the DAO need to actually execute. Would like to see the DAO run a TWAP or VWAP instead. This Option also has the benefit of mitigating the change in user's risk position



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